

WHAT IS CLAIMED IS:

1. A sheet feeder, comprising:
 - a sheet mounting plate that mounts sheets thereon;
 - a pick-up roller provided so as to face the sheet mounting plate, the pick-up roller picking up and feeding one sheet at a time from the sheets mounted on the sheet mounting plate by rotating the pick-up roller when the pick-up roller and the sheet contact each other;
 - a drive motor that generates a drive force; and
 - a transmission device that transmits the drive force from the drive motor to the pick-up roller, the transmission device including:
 - a first drive force transmission device that constantly cooperates with a rotation shaft of the pick-up roller;
 - a switching device that makes a switch between a first condition where a drive force from the drive motor is transmittable to the first drive force transmission device and a second condition where the drive force from the drive motor is not transmittable to the first drive force transmission device;
 - a second drive force transmission device that transmits the drive force from the drive motor to the switching device; and
 - an actuator that moves in accordance with a presence or an absence of the sheets on the sheet mounting plate, the actuator setting the switching device in the second condition when none of the sheets are mounted on the sheet mounting plate.
2. The sheet feeder according to claim 1, wherein the switching device includes:
 - a first gear that receives from the second drive force transmission device the drive force transmitted from the drive motor;
 - a link member that rotatably supports the first gear on one end thereof, the link member being rotatable, in association with rotation of the first gear, in a same direction as the rotation of the first gear; and
 - a second gear that is rotatably supported on the other end of the link member and to which the drive force from the first gear is transmitted, the second gear engaging with the first drive force transmission device in the first condition to transmit the drive force to the first drive force transmission device and being separated from the first drive force transmission device in the second condition, and

the actuator includes a maintaining device that maintains a condition where the second gear is separated from the first drive force transmission device by restricting the link member when none of the sheets are mounted on the sheet mounting plate.

3. The sheet feeder according to claim 1, wherein the actuator includes:

a sheet detecting actuator that detects the presence or absence of the sheets on the sheet mounting plate; and

a drive actuator that operates, in association with the sheet detecting actuator, to set the switching device in the second condition.

4. The sheet feeder according to claim 3, wherein the sheet detecting actuator is pivotally supported about an axis disposed above the center of gravity of the actuator, and the sheet detecting actuator has an end that presses the weight of the sheet detecting actuator against an uppermost surface of the sheets mounted on the sheet mounting plate and that moves in accordance with an amount of the sheets on the sheet mounting plate.

5. The sheet feeder according to claim 4, wherein the sheet mounting plate has an opening, at a portion facing the sheet detecting actuator, for inserting the end of the sheet detecting actuator therein.

6. The sheet feeder according to claim 4, wherein the sheet detecting actuator is fitted over a drive shaft of the second drive force transmission device and is pivotally supported about the drive shaft.

7. The sheet feeder according to claim 3, wherein the actuator has a groove formed on one of the drive actuator and the sheet detecting actuator, and a fitting portion that is provided on the other one of the drive actuator and the sheet detecting actuator and slidably fits in the groove, and through the groove and the fitting portion, a pivotal movement of the sheet detecting actuator is transmitted to the drive actuator and associated therewith.

8. The sheet feeder according to claim 3, wherein the switching device includes:

a first gear that receives from the second drive force transmission device the drive force transmitted from the drive motor;

a link member that rotatably supports the first gear on one end thereof, the link member being rotatable, in association with rotation of the first gear, in a same direction as the rotation of the first gear; and

a second gear that is rotatably supported on the other end of the link member and to which the drive force from the first gear is transmitted, the second gear engaging with the first drive force transmission device in the first condition to transmit the drive force to the

first drive force transmission device and being separated from the first drive force transmission device in the second condition, and

the drive actuator of the actuator includes a maintaining device that maintains a condition where the second gear is separated from the first drive force transmission device by restricting the link member when none of the sheets are mounted on the sheet mounting plate.

9. The sheet feeder according to claim 8, wherein the maintaining device of the drive actuator is a boss that maintains a condition where the second gear is separated from the first drive force transmission device by directly contacting the link member and the boss moves in association with the pivotal movement of the sheet detecting actuator.

10. The sheet feeder according to claim 9, wherein the link member includes a stopper that extends toward the rotating direction of the link member, and the stopper and the maintaining device of the drive actuator contact each other to maintain a condition where the second gear is separated from the first drive force transmission device.

11. The sheet feeder according to claim 3, wherein the sheet detecting actuator includes a spring member to press the sheets on the sheet mounting plate.

12. The sheet feeder according to claim 11, wherein the spring member has a spring force of about 2 to 5g.